NOTE ON *NAUTILUS MOKATTAMENSIS*, A. H. FOORD, FROM THE EOCENE OF EGYPT.

By G. C. Crick, F.G.S., of the British Museum (Natural History).

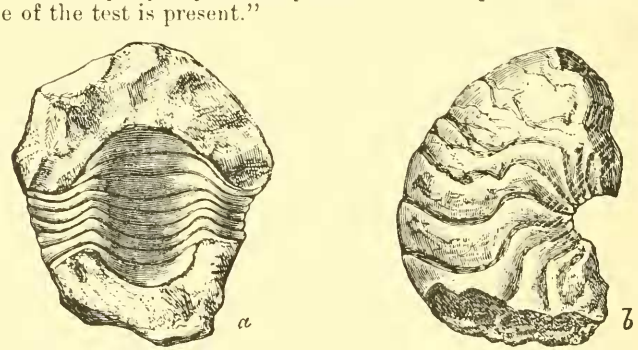
Published by permission of the Trustees of the British Museum.

Read 9th April, 1915.

PLATE VIII.

The species *Nautilus mokattamensis* was founded by Dr. Foord [1] upon two fragments in the British Museum. Of these, one,[2] from the Eocene of the Mokattam range near Cairo, was figured, and may therefore be regarded as the type.

The species was described as follows: "Shell (cast) inflated, somewhat compressed on the sides, rather narrowly rounded on the periphery. Aperture very wide, semi-lunate. Umbilicus small, with steep sides. Septa approximate. Sutures flexuous, forming a conspicuous forwardly-directed lobe [saddle] in the umbilical region, then curved backwards in a broad and shallow sinus, and again a little forwards, and making a narrow [? shallow] but distinct sinus on the periphery. The position of the siphuncle is not seen. None of the test is present."



Nautilus mokattamensis.—*a*, front view of the type-specimen; *b*, lateral view of the same. Eocene: Mokattam range, near Cairo, Egypt. A little less than one-half of the natural size. Original in the British Museum Collection, Geol. Dept., register number 3404. (After Foord.)

The figures do not, however, give quite a correct idea of the fossil. The specimen consists of the natural cast of about one-half of a whorl of the septate portion of a shell; the outer portion of the anterior part of the specimen is very much eroded, more so than is shown in the side view given by the author (see fig. 1*b*), so that the form of the cross-section of the whorl is not quite correctly represented in the front view accompanying the author's description (see fig. 1*a*);

[1] A. H. Foord, Cat. Foss. Ceph. Brit. Mus., p. ii, 1891, pp. 329, 394, figs. 85*a*, *b*.

[2] British Museum Collection, Geol. Dept., register number C. 3404.

the height of the whorl was originally relatively greater. A transverse section of the whorl at about the middle of the fossil has approximately the following dimensions: height, 50 mm.; thickness, 64·5 mm.; height above preceding whorl, 31 mm.; amount of indentation by preceding whorl, 19 mm. The septa are about 18 or 19 mm. apart at the centre of the periphery.

The specimen was presented to the National Collection by Sir Richard Owen, and from the fact that it has been labelled in Dr. Henry Woodward's handwriting: "Nautilus Forbesi, d'Arch."; it is doubtless the specimen referred to under that name by Professor Owen in his paper "On the Fossil Evidence of a Sirenian Mammal from the Nummulitic Eocene of the Mokattam Cliffs, near Cairo" (Quart. Journ. Geol. Soc., vol. xxxi, p. 103, 1875), as may also be inferred from both Dr. Foord's remarks, and the fact that Dr. Foord gives this reference in his synonymy of the species (*op. cit.*, p. 329).

Besides the type, the National Collection contains two other examples, both internal casts, labelled by Dr. Foord "*Nautilus mokattamensis*". One of these,[1] about one-half of the outer whorl of an example of about 90 mm. in diameter, exhibits a portion of the body-chamber, the last camera (or 'air-chamber') being only about one-half of the depth of the preceding chamber, a character from which it may be inferred that the shell belonged to an adult individual, so that the species does not appear to have attained a large size. The other specimen[2] in the collection is labelled "Egypt? Dr. Hooker"; it was transferred from the Museum of Practical Geology together with other foreign collections in 1880. It formed part of a larger shell than either of the other two, and consists only of the umbilical region, the side and part of the peripheral area of about three-fourths of the outer whorl, including a small part of the body-chamber. The umbilicus is very small, and may have been closed when the shell was present. The septa are relatively wider apart than in the other two specimens. The fossil is preserved in a whitish limestone, whilst the specimens from the Mokattam range are in a buff or yellowish-coloured limestone.

In 1901 M. Cossmann[3] described and figured, under the name *Nautilus nubari*, from the Mokattam escarpment near Cairo, a species which he subsequently admitted[4] was the same as Foord's *N. mokattamensis*.

In 1906 a very poor example and a detached septum, both from the Mokattam escarpment, but not from precisely the same locality, were figured, and referred to Foord's species, by P. Oppenheim,[5] who supplemented Cossmann's description, at the same time pointing out its resemblance to Sowerby's *Nautilus imperialis*.

---

[1] British Museum Collection, Geol. Dept., register number 83132.

[2] British Museum Collection, Geol. Dept., register No. C. 3403.

[3] M. Cossmann, "Additions à la faune nummulitique d'Egypte": Bull. Inst. Egypt., sér. IV, no. 1, p. 174, pl. i, fig. 8, 1900 (1901).

[4] M. Cossmann, Rev. crit. Paléozool., vii, p. 67, 1903.

[5] P. Oppenheim, Palæontographica, Bd. xxx, Abth. iii, Lief. 2, p. 344, pl. xxvii, fig. 15, text-figure (fig. 35), 1906.

Since Dr. Foord's original description of *Nautilus mokattamensis* appeared, the National Museum has received as a donation from H. Pearson, Esq., a so much better example of this species from the Mokattam escarpment, near Cairo, that it seems to merit description.

This specimen [1] (Pl. VIII, Figs. *a*, *b*), although smaller than either of the other examples in the collection, is a fairly complete internal cast of the septate portion of a shell, having the following measurements: diameter, 79 mm. (1); height of outer whorl, 45 mm. (0·569); ditto above preceding whorl, 29 mm. (0·367); greatest thickness, 62 mm. (0·784); width of umbilicus, 6 mm. (0·0759). The last two septa are 17·5 mm. apart at the centre of the periphery. Where the whorl is only 16 mm. high and its height above the preceding whorl 10·5 mm., the siphuncle is very near the dorsal (inner) edge of the septum, but with the growth of the shell the siphuncle gradually recedes from the dorsum until at the anterior end of the specimen, i.e., where the whorl is 45 mm. high, it becomes almost exactly median. Commencing suddenly near the median line of the peripheral area of the end of the penultimate whorl, and extending thence over the first sixth of the outer whorl, there is, a little on one side of the median line, a longitudinal fairly deep and broad groove; this ceases rather abruptly, and almost exactly on the median line of the periphery another narrow groove originates and extends over about another sixth of the outer whorl, broadening in its course and gradually disappearing; the median line of the peripheral area of the rest of the whorl is occupied by a fairly distinct raised line (the 'normal line'). The longitudinal groove is accompanied on each side by several obscure irregularly-spaced coarse backwardly-curved ribs, and is evidently the result of injury to the shell. The greatest thickness of the whorl is at about two-fifths of the height of the whorl from the edge of the umbilicus. No portion of the test is present; if it had been preserved the umbilicus would doubtless have been very small, or possibly even closed. The septa are moderately concave, and their dorsal margin is projected forward; there is no dorsal (annular or columellar) lobe even where the whorl is only 16 mm. high, and its height above the preceding whorl 10·5 mm.

The description of the species may therefore be emended as follows: Shell (cast) of medium size, ovate, moderately inflated, rather rapidly expanding; greatest thickness at about two-fifths of the height of the outer whorl from the edge of the umbilicus, about four-fifths of the diameter of the shell; height of outer whorl about four-sevenths of the diameter of the shell. Whorls (? number); inclusion almost complete; umbilicus small. Whorl semi-elliptical in transverse section, about one-third wider than high; indented to about one-third of its height by the preceding whorl; periphery not very broadly rounded, imperfectly defined from the sides, exhibiting 'normal line'; sides convergent, flattened, feebly convex; umbilical zone sloping towards the centre of the umbilicus, convex, with subangular margin. Length of body-chamber and aperture not seen.

[1] British Museum Collection, Geol. Dept., register No. C. 12426.

Chambers moderately deep, about two-ninths of the diameter of the shell in depth at the median line of the periphery, about sixteen in a whorl. Septa moderately concave, their dorsal (inner) margin projected forward. Siphuncle sub-dorsan in the nepionic stage, but gradually becoming median in the ephebic (?) stage. Suture-line with a sinus on the umbilical zone, a well-marked saddle on the outer side of the umbilical margin, a feeble sinus on the middle of the lateral area, a broad low saddle on the peripheral margin, an exceedingly shallow sinus on the peripheral area, and no dorsal (annular or columellar) lobe. Test not seen.

Though apparently closely related to D'Archiac & Haime's *Nautilus forbesi*,[1] of which the type-specimen came from the Eocene of Sind, India, that species is not only, as Dr. Foord pointed out, a "much narrower and more compressed shell", but compared with the Egyptian form its siphuncle is nearer the dorsal (or inner) edge of the septum. From *Nautilus imperialis*,[2] to which the Egyptian form has a considerable resemblance, and which has already been recorded[3] from the Mokattam Range, *Nautilus mokattamensis* is distinguished by its relatively greater thickness, the more nearly median position of its siphuncle, and the greater slope of the outer side of the saddle situated near the umbilical margin.

---

[1] Le Vicomte d'Archiac and Haime, "Description des animaux fossiles du groupe nummulitique de l'Inde," etc., livr. ii, p. 338, pl. xxxiv, figs. 12, 12*a*, 1854. The type-specimen, at one time in the Museum of the Geological Society of London, and bearing the No. R. 9591, is now in the British Museum. It is somewhat crushed, and consists of half of a whorl of the septate portion of the shell, 73·5 mm. (1) in diameter. Its other measurements are: height of outer whorl, 48 mm. (0·653); ditto above preceding whorl, 26 mm. (0·353); greatest thickness, 44 mm. (0·598); centre of siphuncle, 21·5 mm. from the ventral (peripheral) and 4·5 mm. from the dorsal (inner) margin of the septum. The siphuncle is 4·5 mm. in diameter. The umbilicus is obscured by matrix; it was probably nearly closed. There is a feeble umbilical shoulder just on the umbilical side of the saddle on the lateral area. It is obvious from D'Archiac and Haime's fig. 12*a*, which is fairly accurate (except that the outline of the umbilicus seems to have been added), that the lower part of fig. 12 has been restored.

[2] J. Sowerby, Min. Conch., vol. i, No. 1 (June, 1812), p. 9, pl. i, upper, right-hand (with septum in outline below), and middle figures; and J. de C. Sowerby, op. cit., vol. vii, No. 109 (February, 1843), p. 35, pl. dcxxvii, fig. 4. A completely septate example of this species in the British Museum Collection from the London Clay of Primrose Hill, Middlesex [register No. 50164], has the following dimensions: diameter, 54·6 mm. (1); greatest thickness, 38·8 mm. (0·71); height of outer whorl, 34·1 mm. (0·624); ditto above preceding whorl, 22·1 mm. (0·404); centre of siphuncle from the dorsal (inner) edge of the septum, 9·4 mm. The measurements of the present example of *N. mokattamensis* at a diameter of 56 mm. (1) are: thickness of whorl, 42·0 mm. (0·75), and the height of the outer whorl, 31·6 mm. (0·564); and at a diameter of 64·2 mm.: thickness of whorl, 47·8 mm. (0·744); height of outer whorl, 36·4 mm. (0·567); ditto above preceding whorl, 23·3 mm. (0·362); centre of siphuncle from the dorsal (inner) edge of the septum, 8·3 mm.

[3] R. Fourtau, Bull. Inst. Egypt., sér. IV, No. 1, p. 171, 1900 (1901).

Nautilus imperialis is referred by Hyatt [1] to his genus *Eutrephoceras*,[2] and *Nautilus mokattamensis* seems to be referable to the same genus.

EXPLANATION OF PLATE VIII.

Nautilus mokattamensis.—*a*, lateral aspect of a natural internal cast showing the narrow umbilicus and course of the sutures; *b*, front view of the same showing the position of the siphuncle. Eocene: Mokattam range, near Cairo, Egypt. Drawn from a specimen in the British Museum (Natural History), Geol. Dept., register No. C. 12426. Somewhat enlarged.

---

[1] A. Hyatt, "Phylogeny of an acquired characteristic": Proc. Amer. Philos. Soc., vol. xxxii, No. 143, p. 559, 1894.

[2] A. Hyatt, ibid., p. 555. Genotype: *Nautilus dekayi*, Morton (Synop. Org. Rem. Cret. Group, U.S., 1834, p. 33, pl. viii, fig. 4). Hyatt states that in this genus "There are no annular lobes at any stage of development", although in his description (p. 559) of *Eutrephoceras imperiale* (J. Sowerby) he mentions that "This species has an annular lobe which has no connection with the subdorsan siphuncle", though he adds in the next sentence: "I could not find any traces of these (annular lobes) in the older sutures." Of the examples of the species which the present writer has been able to examine, none shows any annular lobe, even where the height of the whorl is only 5·6 mm. (equivalent to a shell-diameter of 8·7 mm.), as in a specimen in the British Museum (No. 68905*a*) from the London Clay, near Chalk Farm, Middlesex.